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| 10/826,537 | 04/15/2004 | Kwok Wai Cheung | IPVBP004 | 2147 |

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| EXAMINER | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/826,537 | CHEUNG ET AL. | |
| | Examiner | Art Unit | |
| | Kile Blair | 2614 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *3/16/10*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3,5-16,18-22,24,25,27 and 31-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-16,18-22,24,25,27 and 31-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

This Office action is in response to the communication filed 3/16/10. Claims 1-3, 5-16, 18-22, 24, 25, 27, and 31-33 are pending. Claims 4, 17, 23, 26, and 28-30 are canceled.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5, 7, 9, 16, 18, 20, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei (US 20010007591 A1, PTO-892 5/2/08) in view of Kim (W. Kim and V. W. Sparrow, "Audio Application of the Parametric Array—Implementation through a Numerical Model," presented at the 113th Convention of the Audio Engineering Society, J. Audio Eng. Soc. (Abstracts), pp. 1-16, November 2002, convention paper 5652., PTO-892 11/25/09) in further view of Takahashi (US 6643377, PTO-892 10/29/07).

Regarding claim 1, Pompei teaches a directional audio delivery apparatus for a system, comprising: audio conversion circuitry that is configured to produce ultrasonic signals based on the decoded audio signals provided by a device (a modulator 112 receives a composite audio signal from the summer 110 and an ultrasonic carrier signal from the carrier generator 114, and modulates the ultrasonic carrier signal with the

composite audio signal, Pompei, [0022]); and a directional speaker that is configured to output an ultrasonic output for a user based on the ultrasonic signals (acoustic transducer array 122, Pompei, [0022]), wherein said apparatus further comprises a beam-attribute control unit operatively connected to said directional speaker (delay circuit 120 for applying a phase shift for steering/focusing/shaping the ultrasonic beam, Pompei, [0035]), said beam-attribute control unit being configured to electronically control an attribute of the output of said directional speaker (the delay circuit causes the phased array to vary audio beam characteristics, Pompei, [0039]), wherein the ultrasonic output yields an audio output (a suitably controlled phased array may transmit multiple ultrasonic beams simultaneously so that multiple audible beams are generated in the desired directions, Pompei, [0039]), wherein the attribute controls the width of the beam of the audio output by controlling the ultrasonic frequency of the ultrasonic signals (ultrasonic beams with different frequencies, [0039]).

Although Pompei does not explicitly teach the feature wherein the attribute controls the width of the beam of the audio output by controlling the ultrasonic frequency of the ultrasonic signals so that if the ultrasonic frequency is increased, the attenuation and the width of the beam are also increased, Kim teaches increasing ultrasonic frequency resulting in a wider beam (Kim, sec. 2.1, pg. 4, right-hand column, fig. 3). It would have been obvious to one of ordinary skill in the art since doing so is the use of a known technique (increasing beam width by increasing carrier frequency) to improve a similar device (ultrasonic system) in the same way. KSR International Co. v. Teleflex Inc., 550 U.S. 398, 82 USPQ2d 1385 (2007). See MPEP § 2143, C.

Kim further teaches the feature wherein the ultrasonic frequency is controlled including by selecting a carrier frequency from a predetermined set of carrier frequencies (carrier signal generation unit, Kim, fig. 16, pg. 11; graph showing the use of various carrier frequencies, Kim, fig. 3, pg. 4), wherein the predetermined set of carrier frequencies are generated via a plurality of substantially identical sources working together to generate each of the carrier frequencies within the predetermined set of carrier frequencies (parametric array wherein there are 30 transducers, fig. 4, pg. 5; each transducer with a 40Khz resonance frequency, Kim, sec. 2.4, pg. 5, right-hand column), and wherein the apparatus allows the ultrasonic frequency to be changed by more than 50% to change the beam width (carrier frequency can be changed from 40kHz to 100kHz, Kim, fig. 3, pg. 4) and it would have been obvious to one of ordinary skill in the art modify Pompei with the above features of Kim with the motivation of further improving the directional audio delivery apparatus of Pompei in the manner disclosed by Kim.

Although Pompei in view of Kim does not teach the limitation of a device that receives incoming encoded signals and provides decoded audio signals for use by the system, Takahashi teaches a set top box (Takahashi, Col. 3, lines 53-57) which inherently receives encoded signals and provides decoded audio signals to the system which outputs ultrasonic waves (Takahashi, Col. 3, lines 44-53). It would have been obvious to use the apparatus of Pompei in view of Kim with any device that receives incoming encoded signals and provides decoded audio signals for use by the system; specifically a set top box as disclosed by Takahashi, with the motivation of outputting

audio with high directionality as disclosed by Takahashi, where the set top box receives an encoded signal and decodes it into an audio signal, at which point the circuitry of Pompei in view of Kim converts it into an ultrasonic signal.

Further, although Pompei in view of Kim does not explicitly disclose the feature wherein the beam-attribute control unit receives wireless inputs from the user via an electronic device to control the attribute, Takahashi teaches a remote controller (commander, Takahashi, col. 4, lines 43-51) for controlling the beam direction by rotating the speakers and it would have been obvious to one of ordinary skill in the art to use the commander of Takahashi with the apparatus of Pompei in view of Kim with the motivation of allowing a user to control the device wirelessly.

Regarding claim 2, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1, wherein said system is one of an audio system, a stereo system, a television system (set top box, Takahashi, Col. 3, lines 53-57), a radio receiver, Digital Versatile Disc (DVD) player, a compact disc (CD) player, and a Video Cassette Recorder (VCR) player.

Regarding claim 3, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei does not explicitly disclose that the speaker is repositionable with respect to the system in his own invention, Pompei does disclose that the prior art teaches a directional speaker that is repositionable with respect to said system (ultrasonic signal is typically directed along the selected projection path by a mechanical steering device, Pompei, [0006]). It would have been obvious to one of ordinary skill in the art to implement, into the apparatus of

Pompei in view of Kim in further view of Takahashi, the feature of mechanical steering, or repositioning, as disclosed as prior art by Pompei since doing so would have been obvious to try.

Regarding claim 5, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1, wherein said beam-attribute control unit is also configured to electronically control a beam direction of the audio output of said directional speaker so that the beam direction of the audio output can be changed (steering the modulated ultrasonic beam in a direction electronically, Pompei, [0040]).

Regarding claim 7, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1, wherein said directional speaker has a plurality of separately controllable regions, and wherein said beam-attribute control unit activates one or more of the controllable regions to control the ultrasonic output from said directional speaker (the acoustic transducers 0-11 [Pompei, 0025] each output an ultrasonic beam simultaneously so that multiple audible beams are generated in desired directions, [Pompei, 0039]).

Regarding claim 9, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1, further comprising one additional directional speaker to create stereo effect (left and right speakers, Takahashi, Col. 3, lines 44-53). Although Pompei in view of Kim in further view of Takahashi does not explicitly teach the feature of using two speakers to create a stereo effect, it would have been obvious to one of ordinary skill in the art to use this configuration as

disclosed by Takahashi with the motivation of creating a stereo effect which is well known in the art.

Claim 16 is substantially similar to claim 1 and is rejected for the same reasons.

Regarding claim 18, Pompei in view of Kim in further view of Takahashi teaches a method as recited in claim 16.

Although Pompei in view of Kim in further view of does not explicitly disclose altering the orientation of the directional speaker, Pompei does disclose that the prior art teaches a directional speaker that is repositionable with respect to said system (ultrasonic signal is typically directed along the selected projection path by a mechanical steering device, Pompei, [0006]) and Takahashi discloses a rotating speaker (col. 5, lines 11-15). It would have been obvious to one of ordinary skill in the art to implement, into the method of Pompei in view of Kim in further view of Takahashi, the feature of mechanical steering, or repositioning, as disclosed as prior art by Pompei with the motivating of outputting sound in various directions.

Regarding claim 20, Pompei in view of Kim in further view of Takahashi teaches a method as recited in claim 16, wherein the beam attribute input being received is automatically provided, not based on an input entered by the user (the temperature/humidity control device 130 may include a thermostatically controlled cooler, or a dehumidifier that maintains desired atmospheric conditions along the path traversed by the ultrasonic beam based on the preexisting atmospheric conditions, Pompei, [0044]).

Regarding claim 22, Pompei in view of Kim in further view of Takahashi teaches a method as recited in claim 16, wherein the directional speaker has a plurality of segments to emit the directionally constrained audio; and wherein the segments can be individually controlled for emitting the directionally constrained audio (the acoustic transducers 0-11 [Pompei, 0025] each output an ultrasonic beam simultaneously so that multiple audible beams are generated in desired directions, [Pompei, 0039]).

Regarding claim 24, Pompei in view of Kim in further view of Takahashi teaches a method as recited in claim 22, wherein the attribute controls at least one of the many segments to affect the width or the direction of the directionally constrained audio (the temperature/ humidity control maintains desired atmospheric conditions along the path traversed by the ultrasonic beam, from the transducer to the listener, Pompei [0044]).

Claims 6, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Kim in further view of Takahashi in further view of Kuriyama (JP 1109898, PTO-892 11/18/08).

Regarding claim 6, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 5.

Although Pompei in view of Kim in further view of Takahashi does not explicitly disclose the feature wherein the beam direction depends on the position of an electronic device, and wherein as the position of the electronic device changes, the beam direction can automatically change, Takahashi does teach a remote controller (commander, Takahashi , col. 4, lines 43-51) for controlling the beam direction by rotating the

speakers, although not the specific feature wherein the beam direction changes as the position of the electric device (i.e. remote control) changes. Kuriyama teaches a system of directing a set of speakers to a remote control based on signals transmitted to a light receiving element indicating a position of the remote control (see English abstract and constitution) and it would have been obvious to use this system of automatic beam direction control with the apparatus of Pompei in view of Kim in further view of Takahashi with the motivation of improving a similar device with the feature of automatic beam direction control in the same way that Kuriyama has improved a conventional speaker and remote control unit.

Regarding claim 19, Pompei in view of Kim in further view of Takahashi teaches a method as recited in claim 16.

Although Pompei in view of Kim in further view of Takahashi does not explicitly teach the feature wherein the beam attribute input depends on a distance or a position of an object, Kuriyama teaches directing a set of speakers to a remote control based on signals transmitted to a light receiving element indicating a position of the remote control (see English abstract and constitution, Kuriyama) and it would have been obvious to one of ordinary skill in the art to implement the feature of directing a set of speakers to a remote control with the apparatus of Pompei in view of Kim in further view of Takahashi with the motivation of customizing the sound output to the position of a user.

Regarding claim 21, Pompei in view of Kim in further view of Takahashi teaches a method as recited in claim 16.

Although Pompei in view of Kim in further view of Takahashi does not explicitly teach the feature wherein in view of a beam-attribute input, the direction of the directionally constrained audio is changed, Kuriyama teaches directing a set of speakers to a remote control based on signals transmitted to a light receiving element indicating a position of the remote control (see English abstract and constitution, Kuriyama) and it would have been obvious to one of ordinary skill in the art to implement the feature of directing a set of speakers to a remote control with the apparatus of Pompei in view of Kim in further view of Takahashi with the motivation of customizing the sound output to the position of a user.

Claims 8 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Kim in further view of Takahashi in further view of Norris (US 20040052387 A1, PTO-892 5/2/08).

Regarding claim 8, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei in view of Kim in further view of Takahashi does not explicitly teach the feature wherein said directional speaker has a curved surface, which can be a curved emitting surface or a curved reflecting surface, so that the audio output produced is configured to be non-collinear, Pompei does teach that multiple audible beams may be generated in desired directions (Pompei, [0039]). Norris discloses a speaker with a convex emitter plate comprising an array of cavities that allows sound to be generated over a broad area (Norris, [0154]). It would have been obvious to one of ordinary skill in the to use the

devices of Pompei and Norris to cause the sound output to be non-collinearly generated in a number of directions since doing so would have yielded a predictable result.

Regarding claim 25, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei in view of Kim in further view of Takahashi in further view of Kuriyama does not explicitly teach the feature wherein the beam-attribute control unit is configured to change a beam width of the audio output of said directional speaker so that the beam width is diverging around the vicinity of the user, Norris discloses a convex configuration of transducers (Norris, Fig. 15) and it would have been obvious to one of ordinary skill in the art to configure the transducer array of Pompei in such a manner as that of Norris with the motivation of having the ultrasonic beams diverge around the user after being affected by the temperature/humidity control device (the temperature/humidity control device maintains desired atmospheric conditions along the path traversed by the ultrasonic beam, Pompei, [0044]).

Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Kim in further view of Takahashi in further view of Wiser (US 20030009248 A1, PTO-892 2/22/08).

Regarding claim 10, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1.

Although Pompei in view of Kim in further view of Takahashi does not explicitly teach the feature wherein said apparatus further comprises a personalization unit

operatively connected to said audio conversion circuitry, said personalization unit modifies the audio signals or the ultrasonic signals in accordance with an audio characteristic associated with a user of said apparatus, it would have been obvious to one of ordinary skill in the art to utilize the audio processing profiles of Wiser ([0088]) into the set top box of Pompei in view of Kim in further view of Takahashi with the motivation of providing a more suitable and personalized audio signal to the individual.

Regarding claim 12, Pompei in view of Kim in further view of Takahashi in further view of Wiser teaches a directional audio delivery apparatus as recited in claim 10, wherein the audio characteristic pertains to a hearing characteristic and/or a hearing preference associated with the user (user can edit audio profile using equalizer button, Wiser, [0088]).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Kim in further view of Takahashi in further view of Wiser and in further view of Brain (Brain; Marshall, How USB Ports Work, October 11, 2002, www.howstuffworks.com/usb, IDS 1/17/08).

Regarding claim 11, Pompei in view of Kim in further view of Takahashi in further view of Wiser teaches a directional audio delivery apparatus as recited in claim 10.

Although Pompei in view of Kim in further view of Takahashi in further view of Wiser does not explicitly teach the feature wherein the audio characteristic is provided to said directional audio delivery apparatus in a removable, portable data storage device that can be electrically connected to said apparatus, it would have been obvious to one

of ordinary skill in the art to store the audio characteristic in a portable USB drive as taught by Brain (storage device, pg. 4, ¶ 5) with the motivation of making the characteristics portable from set top box to set top box.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Kim in further view of Takahashi in further view of Sutherland (US 6041657) and in further view of Tokumo (US 4476571, PTO-892 11/18/08).

Regarding claim 13, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1.

Although Pompei in view of Kim in further view of Takahashi does not explicitly teach the feature wherein said directional audio delivery apparatus further comprises an environmental adjustment unit that is configured to modify the audio signals or the ultrasonic signals in accordance with a piece of information from the environment in the vicinity of a handheld device used by the user of said apparatus, Sutherland teaches a handheld wireless computer terminal 18 which is in two way communication with an interior sound measurement sensor 16 (Sutherland, col. 2, line 66- col. 3, line 11, fig. 3) for detecting noise (Sutherland, col. 2, lines 19-22) and Tokumo teaches adjusting the volume level of audio signals based on environmental noise levels (Tokumo, abstract) and it would have been obvious to one of ordinary skill in the art to improve the apparatus of Pompei in view of Kim in further view of Takahashi with the same noise adjustment feature of Tokumo using the handheld wireless computer terminal with

measurement sensor of Sutherland since it is well known in the art to adjust a volume based on an environmental noise level.

Regarding claim 14, Pompei in view of Kim in further view of Takahashi in further view of Sutherland and in further view of Tokumo teaches a directional audio delivery apparatus as recited in claim 13, wherein the piece of information includes a noise level (determining the level equivalent average noise generated by a work implement, Sutherland, col. 2, lines 19-22).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Kim in further view of Takahashi in further view of Tanaka (US 4823908, IDS 1/17/08).

Regarding claim 15, Pompei in view of Kim in further view of Takahashi teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei in view of Kim in further view of Takahashi does not explicitly teach the feature wherein the ultrasonic output from said directional speaker is reflected by at least one reflecting surface (ultrasonic wave radiator 8 which reflects of the reflective plate 19 as seen in Fig. 16 of Tanaka, col.10, lines 7-21) before propagating into the free space where a user of the apparatus is positioned, as directionally-constrained audio output, it would have been obvious for one of ordinary skill in the art to use the reflective plate of Tanaka with the directional audio delivery apparatus of Pompei in view of Kim in further view of Takahashi with the motivation of providing a directional ultrasonic signal to a user with the some attenuation to protect the user from waves that are too powerful and

potentially harmful, a concern recognized by Pompei (to reduce the possibility of exceeding an allowable ultrasound exposure, a ranging unit 540 is provided for determining the distance to the nearest listener and appropriately adjusting the output of the adaptive parametric audio system by way of the amplifier, Pompei, [0054]).

Claims 27 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen (US 20020149705 A1, IDS 1/17/08) in view of Pompei in further view of Kim.

Regarding claim 27, Allen teaches a handheld electronic remote control to control a system for displaying video signals (hybrid communicator/remote control 106 is provided for convenient remote operation of the television, [0045]), the handheld electronic remote control comprising: a device that receives incoming encoded signals and provides decoded audio signals (wireless receiver 204 for receiving signal from the STB 102 and a decoder for separating and demodulating data from the carrier signal, [0053]; decoding digitally-encoded signals, [0054]); audio circuitry that produces audio signals based on the decoded audio signals provided by said device (audio signals received through the wireless receiver 204, [0048]); and a speaker that outputs an audio output for a user based on the audio signals (speaker 242 for generating an audible output from an audio signal, [0048]).

Although Allen does not explicitly teach the feature of audio conversion circuitry that produces ultrasonic signals based on the decoded audio signals provided by said device; and a directional speaker that outputs an ultrasonic output for a user based on the ultrasonic signals, with the ultrasonic output generating audio output, Pompei in

view of Kim teaches a directional audio delivery apparatus utilizing ultrasonic signals as detailed in the rejection of claim 1 above and it would have been obvious one of ordinary skill in the art to implement the directional audio delivery apparatus taught by the combination of Pompei in view of Kim in the hybrid communicator/remote control 106 of Allen in place of the presumably non-directional speaker of Allen with the motivation of providing regeneration of audio signals along selected paths of projection as disclosed by Pompei (Pompei, [0021]).

Regarding claim 31, Allen in view of Pompei in view of Kim teaches a handheld electronic remote control as recited In claim 27 further comprising; a beam-attribute control unit operatively connected to said directional speaker (delay circuit 120 for applying a phase shift for steering/focusing/shaping the ultrasonic beam, Pompei, [0035]), said beam-attribute control unit being configured to electronically control an attribute of the output of said directional speaker (the delay circuit causes the phased array to vary audio beam characteristics, Pompei, [0039]).

Although Allen in view of Pompei in view of Kim does not explicitly teach the feature of a beam-attribute input mechanism that allows the user to set a beam attribute input for the beam-attribute control unit, wherein the beam attribute input controls the width of the beam of the audio output of the directional speaker by controlling the ultrasonic frequency of the ultrasonic signals so that if the ultrasonic frequency is increased, the attenuation and the width of the beam of the audio output are also increased, Allen teaches volume buttons 220 on the hybrid communicator/remote control 106 (Allen, [0047]) and Kim teaches that a signal with a higher carrier frequency

is attenuated faster and has a wider beam (Kim, sec. 2.1, pg. 4, right-hand column). Kim also teaches that the parameters of the beam are determined based on the type of application and how wide the beam needs to be (Kim, sec. 2.1, pg. 4, right-hand column).

It would have been obvious to one of ordinary skill in the art to allow the user to adjust the carrier frequency of the ultrasonic signal using a frequency adjustment buttons similar to the volume buttons 220 of Allen with the motivation of obtaining a desired beam width as disclosed by Kim (determining parameters depending in how narrow the beam needs to be, Kim, sec. 2.1, pg. 4, right-hand column).

Regarding claim 32, Allen in view of Pompei in view of Kim teaches a handheld electronic remote control as recited in claim 31.

Although Allen in view of Pompei in view of Kim does not explicitly teach the feature wherein the ultrasonic frequency is controlled including by selecting a carrier frequency from a predetermined set of carrier frequencies, and wherein the handheld electronic remote control allows the ultrasonic frequency to change by more than 50% to change the beam width, Kim teaches a carrier signal generation unit (Kim, fig. 16, pg. 11) and a graph showing the use of various carrier frequencies wherein the wherein the carrier frequency can be changed from 40kHz to 100kHz (Kim, fig. 3, pg. 4), it would have been obvious to one of ordinary skill in the art to modify Allen in view of Pompei in view of Kim with the above features of Kim with the motivation of further improving the directional audio delivery apparatus in hybrid communicator/remote control 106 of Allen in the manner disclosed by Kim.

Regarding claim 33, Allen in view of Pompei in view of Kim teaches a handheld electronic remote control as recited in claim 31, wherein said system is one of a television system (hybrid communicator/remote control 106 is provided for convenient remote operation of the STB 102 and the television 104, Allen, [0034]), a Digital Versatile Disc (DVD) player, a compact disc (CD) player, and a Video Cassette Recorder (VCR) player.

### *Response to Arguments*

Applicant's arguments filed 3/16/10 have been fully considered but they are not persuasive.

Applicant argues that increasing beam width by increasing carrier frequency is not commonly known in the art and is unexpected; however, the examiner disagrees since Kim teaches a higher carrier frequency corresponding to a wider beam (Kim, sec. 2.1, pg. 4, right-hand column).

Applicant's arguments with respect to the feature wherein ultrasonic frequency is controlled including by selecting a carrier frequency from a predetermined set of carrier frequencies has been considered but is moot in view of the new ground(s) of rejection.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kile Blair whose telephone number is (571) 270-3544. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K.B./

/Xu Mei/
Primary Examiner, Art Unit 2614